

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently amended) An apparatus that translates host names into
2 Internet Protocol (IP) addresses, comprising:
3 a plurality of name servers, wherein each name server is configured to
4 translate a host name into a corresponding IP address; and
5 a plurality of load balancers coupled to the plurality of name servers,
6 wherein each load balancer is configured to,
7 receive requests for host name translations at a load
8 balancer, and to
9 distribute the requests between the plurality of name servers so as to
10 balance load across the plurality of name servers;
11 wherein load balancers in the plurality of load balancers are organized into
12 a ring;
13 wherein each load balancer is configured to take over load balancing
14 operations for a neighboring load balancer in the ring, if the neighboring load
15 balancer fails; and
16 wherein the plurality of load balancers are configured to operate in parallel
17 in distributing requests between the plurality of name servers.

1 2. (Currently amended) The apparatus of claim 1, wherein each of the
2 plurality of load balancers is associated with its own IP address, and is configured
3 to process translation requests directed to its own IP address.

1 3. (Original) The apparatus of claim 1, wherein each of the plurality of
2 load balancers is configured to take over load balancing operations for one or
3 more failed load balancers in the plurality of load balancers.

1 4 (Canceled).

1 5. (Original) The apparatus of claim 1, wherein each load balancer in the
2 plurality of load balancers is a proxy server that is configured to accept user
3 datagram protocol (UDP) and transmission control protocol (TCP) connections
4 from domain name system (DNS) clients, and to forward corresponding UDP or
5 proxy TCP requests to the plurality of name servers.

1 6. (Original) The apparatus of claim 1, wherein each of the plurality of
2 load balancers is configured to distribute translation requests between the plurality
3 of name servers based upon measured response times of the plurality of name
4 servers.

1 7. (Original) The apparatus of claim 1, further comprising an internal
2 communication network that couples the plurality of load balancers with the
3 plurality of name servers.

1 8. (Currently amended) A method for translating a host name into an
2 Internet Protocol (IP) address, comprising:
3 receiving a translation request at a load balancer within a plurality of load
4 balancers to translate the host name into the IP address;
5 wherein the plurality of load balancers are organized into a ring; and
6 wherein each load balancer is configured to take over load balancing
7 operations for a neighboring load balancer in the ring;

8 selecting a name server from a plurality of name servers to process the
9 translation request based upon a measured load of the plurality of name servers, so
10 that overloaded name servers will not be selected; and
11 forwarding the translation request to the selected name server so that the
12 selected name server can translate the host name into the IP address.

1 9. (Original) The method of claim 8, wherein receiving the translation
2 request involves receiving the translation request at one of a plurality of load
3 balancers, wherein each load balancer is configured to:
4 receive translation requests for host name translations; and to
5 distribute the translation requests between the plurality of name servers so
6 as to balance load across the plurality of name servers.

1 10. (Currently amended) The method of claim 9, wherein each of the
2 plurality of load balancers is associated with its own IP address, and is configured
3 | to process translation requests directed to its own IP address.

1 11. (Original) The method of claim 9, further comprising taking over load
2 balancing operations, if necessary, for one or more failed load balancers in the
3 plurality of load balancers.

1 12 (Canceled).

1 13. (Original) The method of claim 9, wherein each load balancer in the
2 plurality of load balancers is a proxy server that is configured to accept user
3 datagram protocol (UDP) and transmission control protocol (TCP) connections
4 from domain name system (DNS) clients, and to forward corresponding UDP or
5 proxy TCP requests to the plurality of name servers.

1 14. (Original) The method of claim 8, further comprising measuring a load
2 on the plurality of name servers by periodically:
3 sending an information request to each name server in the plurality of
4 name servers; and
5 measuring a response time to the information request for each name server
6 in the plurality of name servers.

1 15. (Currently amended) A method for performing failovers between a
2 plurality of load balancers that are configured to balance requests for host name to
3 IP address translations between a plurality of name servers that are coupled to the
4 plurality of load balancers, comprising:
5 sending a keep alive packet to a first neighboring load balancer in the
6 plurality of load balancers;
7 wherein the plurality of load balancers are organized into a ring; and
8 wherein each load balancer in the plurality of load balancers is configured
9 to take over load balancing operations for a neighboring load balancer in the ring;
10 waiting for a response to the keep alive packet in order to determine if the
11 first neighboring load balancer remains alive;
12 if the first neighboring load balancer does not remain alive, taking over
13 servicing of translation requests directed to the first neighboring load balancer.

1 16. (Original) The method of claim 15, further comprising:
2 receiving a second keep alive packet from a second neighboring load
3 balancer in the plurality of load balancers; and
4 sending a response to the second keep alive packet to the second
5 neighboring load balancer.

1 17. (Original) The method of claim 15, wherein each of the plurality of
2 load balancers is associated with its own IP address, and is configured to process
3 translation requests directed its own IP address.

1 18 (Canceled).

1 19. (Original) The method of claim 15, wherein each load balancer in the
2 plurality of load balancers is a proxy server that is configured to accept user
3 datagram protocol (UDP) and transmission control protocol (TCP) connections
4 from domain name system (DNS) clients, and to forward corresponding UDP or
5 proxy TCP requests to the plurality of name servers.

1 20. (Original) The method of claim 15, further comprising distributing
2 translation requests between the plurality of name servers based upon measured
3 response times of the plurality of name servers.

1 21. (Currently amended) An apparatus that translates host names into
2 Internet Protocol (IP) addresses, comprising:
3 a plurality of name servers, wherein each name server is configured to
4 translate a host name into a corresponding IP address; and
5 a plurality of load balancers coupled to the plurality of name servers,
6 wherein each load balancer is configured to,
7 receive requests for host name translations at a load
8 balancer, and to
9 distribute the requests between the plurality of name servers
10 so as to balance load across the plurality of name servers;
11 wherein the plurality of load balancers are configured to operate in parallel
12 in distributing requests between the plurality of name servers;

13 wherein each of the plurality of load balancers is configured to take over
14 load balancing operations for one or more failed load balancers in the plurality of
15 load balancers; and
16 wherein each of the plurality of load balancers is configured to distribute
17 translation requests between the plurality of name servers based upon measured
18 response times of the plurality of name servers.

1 22. (Currently amended) A method for translating a host name into an
2 Internet Protocol (IP) address, comprising:
3 receiving a translation request at one of a plurality of load balancers to
4 translate the host name into the IP address;
5 selecting a name server from a plurality of name servers to process the
6 translation request based upon a measured load of the plurality of name servers, so
7 that overloaded name servers will not be selected;
8 forwarding the translation request to the selected name server from the
9 load balancer so that the selected name server can translate the host name into the
10 IP address; and
11 taking over load balancing operations, if necessary, for one or more failed
12 load balancers in the plurality of load balancers;
13 wherein each load balancer is configured to distribute the translation
14 requests between the plurality of name servers so as to balance load across the
15 plurality of name servers.

1 23. (Currently amended) A method for performing failovers between a
2 plurality of load balancers that are configured to balance requests for host name to
3 IP address translations between a plurality of name servers that are coupled to the
4 plurality of load balancers, comprising:

5 distributing translation requests between the plurality of name servers
6 based upon measured response times of the plurality of name servers;
7 sending a keep alive packet to a first neighboring load balancer in the
8 plurality of load balancers;
9 wherein the plurality of load balancers are organized into a ring; and
10 wherein each load balancer in the plurality of load balancers is configured
11 to take over load balancing operations for a neighboring load balancer in the ring;
12 waiting for a response to the keep alive packet in order to determine if the
13 first neighboring load balancer remains alive;
14 if the first neighboring load balancer does not remain alive, taking over
15 servicing of translation requests directed to the first neighboring load balancer;
16 receiving a second keep alive packet from a second neighboring load
17 balancer in the plurality of load balancers; and
18 sending a response to the second keep alive packet to the second
19 neighboring load balancer.